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Patient Gender Affects the Referral and Recommendation for Total Joint Arthroplasty

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Abstract
Background Rates of use of total joint arthroplasty among appropriate and willing candidates are lower in women than in men. A number of factors may explain this gender disparity, including patients' preferences for surgery, gender bias influencing physicians' clinical decision-making, and the patient-physician interaction.
Questions/purposes We propose a framework of how patient gender affects the patient and physician decision-making process of referral and recommendation for total joint arthroplasty and consider potential interventions to close the gender gap in total joint arthroplasty utilization.
Methods The process involved in the referral and recommendation for total joint arthroplasty involves eight discrete steps. A systematic review is used to describe the influence of patient gender and related clinical and non-clinical factors at each step.
Where are we now? Patient gender plays an important role in the process of referral and recommendation for total joint arthroplasty. Female gender primarily affects Steps 3 through 8, suggesting barriers unique to women exist in the patient-physician interaction.
Where do we need to go? Developing and evaluating interventions that improve the quality of the patient-physician interaction should be the focus of future research.
How do we get there? Potential interventions include using decision support tools that facilitate shared decision-making between patients and their physicians and promoting cultural competency and shared decision-making skills programs as a core component of medical education. Increasing physicians' acceptance and awareness of the unconscious biases that may be influencing their clinical decision-making may require additional skills programs.

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Introduction

Total joint arthroplasty (TJA) is a cost-effective treatment for relieving pain and restoring function in individuals with moderate to severe hip and knee osteoarthritis (OA) when medical therapy fails [32, 52]. However, there is reason to believe not all appropriate candidates receive TJA. Although rates of TJA are higher among women than among men [43], these analyses are based on administrative data, which tell us only about who is getting care, not about who is not.

Two population-based epidemiologic surveys, one conducted in Canada [33] and a more recent study conducted in the United Kingdom [40], which had taken OA prevalence and indications for TJA into account, found low utilization of TJA among medically appropriate and willing surgical candidates in both genders, but an even lower utilization among women. Because a similar population-based study has not yet been performed in the United States, there still remains some uncertainty about the existence of a gender disparity in TJA utilization in the United States. In both population-based studies cited, women were less likely than men to have discussed TJA with a physician, to have consulted an orthopaedic surgeon, and to be on a TJA waiting list [33, 40]. Women, compared with men, also have worse pain and disability at the time of TJA surgery [32, 36, 45, 54], suggesting they are operated on at a more advanced stage of disease.

Gender disparity in TJA utilization [26, 33, 40] is an example of a broader phenomenon of gender disparities in other medical or surgical interventions [23, 61]. The gender disparity in TJA utilization cannot be explained by clinical need, as the prevalence and severity of OA are disproportionately higher in women than men [55]. Nor is it likely to be explained by differential access to health care because most people with advanced OA are older than 65 years and eligible for Medicare in the United States or have universal access in Canada [65]. While there are many possible explanations, there is little definitive evidence to explain the differential utilization of TJA between genders. The most likely explanations exist at the patient level, the physician level, or both. Patient-level potential causes include patients' perceptions (or misperceptions) of TJA indications, risks, and benefits [16, 31, 33, 37, 44] or preferences for surgery [30, 33, 34, 42]. Another possible explanation is that gender bias may contribute to the gender disparity in rates of use of TJA, as physicians were less likely to recommend TKA and included fewer shared decision-making elements when the patient was a woman compared to a man [6, 7]. Barriers for women may also exist in the patient-physician interaction [33].

We propose a multistep framework of the patient and physician decision-making process of referral and then recommendation for TJA and conducted a systematic review to describe how patient gender and related clinical and nonclinical factors affect each step in the process. There are eight discrete steps in the decision-making process from the initial recognition by patients that their OA symptoms are treatable to the decision on whether or not to have TJA (Fig. 1). Disparity may result from inequities at any of these steps. This framework, adapted from a previous discussion of how patients' race and gender influence cardiac care [20, 62], allows for detailed consideration of potential interventions to eliminate gender disparity in TJA utilization.

Search Strategy and Criteria

We conducted a systematic review by searching MEDLINE (1948 to January 2011) to identify all citations related to TJA utilization and patient and/or physician decision-making in TJA. The literature review began with the search terms to encompass "sex and/or gender" AND "osteoarthritis and/or arthritis" AND "total joint arthroplasty." An additional search using the search terms "decision making" AND "total joint arthroplasty" was performed, as a number of known relevant articles were not captured by the first search (see Appendix 1 for the MEDLINE search strategy). Our search yielded 504 articles. After title and abstract review, 128 citations were identified as potentially relevant and retrieved for full article review. Of the subset of 128, 71 dealt with disparity in the utilization of TJA or patient and/or physician decision-making in TJA; however, of these, only 38 were related to gender disparity (33) or the effect of patient gender on patient and/or physician decision-making (five) in particular. We also searched the reference lists of these 38 articles and reviewed abstracts of any potentially relevant citations. The other 57 articles provided the relevant background to rates of TJA by gender (eight) and outcome after TJA by gender (49).

Steps in Framework

Step 1. Patient Recognizes Symptoms

The first step in the process is when patients recognize they have a treatable medical condition. Both the Canadian and the UK population-based surveys found, among individuals with disabling hip or knee OA considered medically appropriate for surgery, only ⅓ were willing to consider TJA [34, 40]. The majority of patients did not believe they were surgical candidates because they viewed their OA not as a disease but as a natural and inevitable part of aging [16, 31, 37]. Furthermore, many believed to undergo TJA

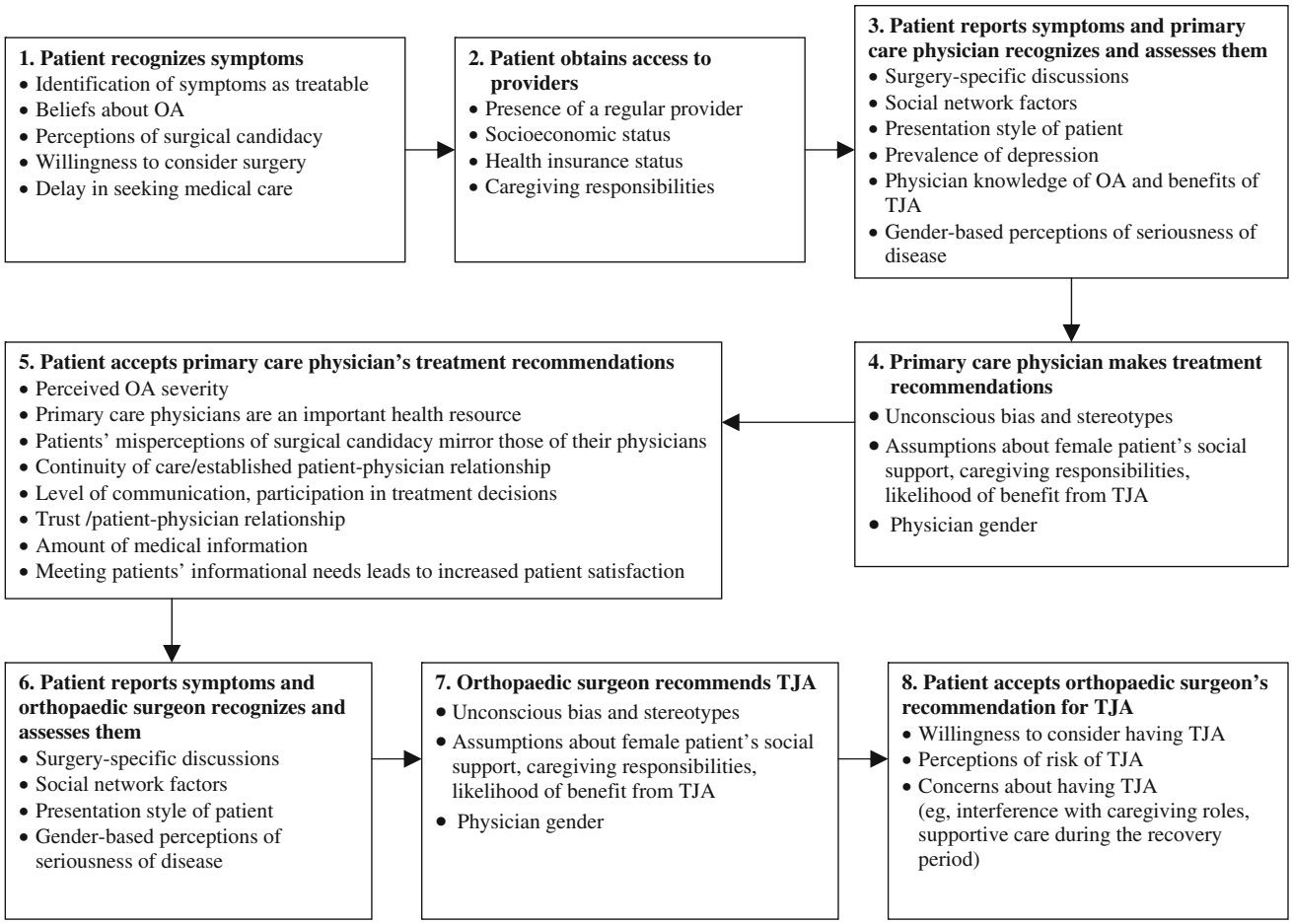

Fig. 1 A flow diagram shows the eight steps in the process of referral and recommendation for TJA and factors that may influence patient or physician decision-making at each step in the process.

meant their pain and disability needed to be higher than their current level. Women may perceive their pain and disability differently from men or acquiesce to a lower functional level [44] and this might lead to differential presentation to primary care physicians. However, for comparable levels of OA severity and comorbid conditions, women are at least as willing (or unwilling) as men to consider TJA [33]. Furthermore, women are more likely than men to seek treatment for their OA [33] and other medical conditions [4]. Thus, this step does not appear to have an important influence on gender disparity in TJA utilization.

Step 2. Patient Obtains Access to Providers

After recognizing the symptoms of OA, the patient needs access to a healthcare provider, usually a primary care physician. Compared with men, women are more likely to have a primary care provider [1], use primary care more frequently [1], and receive more healthcare services [4].

Access barriers are also less relevant for TJA because most people with advanced OA are 65 years or older and are therefore eligible for Medicare in the United States or have universal access to health care in Canada [65]. However, women, especially women older than 65 years, in whom OA is most prevalent [55], are more likely to live in poverty [48]. This raises the question of whether differential access to TJA may be influenced by socioeconomic status (SES). In the Canadian population-based cohort, utilization of TJA was lower among those with low SES versus those with high SES and no different among men and women with low SES, whereas utilization of TJA was lower in women than men among those with higher SES [33], suggesting gender disparity in TJA utilization is not explained by SES. There is evidence that women have greater access to care than men [1, 4], suggesting there is no inequity at this step that would explain the gender disparity in TJA. However, the greater effort women make in seeking care for their OA results in less care in the subsequent steps.

Step 3. Patient Reports Symptoms and Primary Care Physician Recognizes and Assesses Them

After presenting symptoms of chronic hip or knee pain, the primary care physician must recognize the patient's disease and need for treatment. Among those considered medically appropriate for surgery, women were less likely than men to have discussed TJA with a physician [33]. Social network factors are a major determinant of what patients discuss with their physicians. Women are less likely to receive advice from a friend or family member to discuss surgery with their physician [31]. Fewer surgery-specific patient-physician interactions would almost certainly result in fewer referrals to orthopaedic surgery.

Primary care physicians may not recognize the seriousness of a female patient's symptoms and her surgical candidacy. One factor may be the way patients describe their symptoms. Women tend to speak more openly and personally about their symptoms and describe them in a narrative style, compared with men who typically present their symptoms in a business-like or factual manner and are more reserved in their comments [68]. Women's narrative presentation style reportedly contributed to physicians making more diagnostic errors in their evaluations of chest pain with women than with men [5]. A differing presentation style of male and female patients may also contribute to the gender disparity in rates of use of TJA [6].

Physicians reportedly minimized women's symptoms and attributed them to emotional rather than physical causes [67] and referred women less often than men for specialty care even when women have a similar or greater disease severity [24, 61]. However, among older adults with OA, the prevalence of depression can be as high as 21% [59], with women more likely to be clinically depressed than men. While depression is not a contraindication to TJA, women may be more likely to be advised to seek treatment for their depression first and postpone surgery to improve their odds of a successful outcome. On the other hand, given that men are more reluctant than women to seek care [4], physicians may believe, if a man comes to see them, his OA must really be bad. Men are also more likely to question the physician's decision and discuss treatment options [66]. Thus, there are a number of factors influencing why women are less likely than men to reach the next step.

Step 4. Primary Care Physician Makes Treatment Recommendations

If the disease severity is recognized, the primary care physician refers the patient, or as is often the case in the United States, the patient self-refers, to an orthopaedic surgeon. Primary care physicians consider the clinical evidence but also patients' informational needs, decision-making style, and other preferences. A reasonable goal would be that patients with the same clinical characteristics should receive the same information and the same treatment options. Prior research indicates primary care physicians do not refer women for an orthopaedic surgeon consultation until they have a relatively greater disability than men [36, 45].

In prior opinion surveys, primary care physicians indicated patient gender has no effect on their decision to refer a patient for TKA [17], but in actual clinical practice, behavior is different. Using standardized patients, one man and one woman with moderate knee OA and otherwise identical clinical scenarios who visited blinded physicians, primary care physicians were less likely to refer to orthopaedic surgery when the patient was a woman compared to a man [6]. Primary care physicians' less aggressive treatment recommendations with a woman than with a man may be a result of an unconscious bias. Based on patients' gender and potential activation of a stereotype in the physician's memory [19], physicians may make assumptions about a patient's level of social support and caregiver responsibilities [38] or hold the inappropriate preconception that women do not receive the same benefit from TJA as men [6].

Although female physicians are more participatory and spend more time with their patients than male physicians [41, 58], this does not make them any less susceptible to the biases that are pervasive in society [57]. In our standardized patient study, female and male physicians provided similar rates of recommendation for TKA to the female and male standardized patients [6]. In summary, female gender is a barrier to referral for TJA and may contribute to the gender disparity in the rates of use of TJA.

Step 5. Patient Accepts Primary Care Physician's Treatment Recommendations

Once recommended to see an orthopaedic surgeon, patients' perceived OA severity plays a major role in determining whether a patient accepts their primary care physicians' treatment recommendations. Patients' misperceptions about candidacy for TJA seem to mirror those of their primary care physicians [17]. Patients, too, perceive surgery to be indicated only as a last resort, believing their OA pain and disability need to be extreme before TJA should be considered [31, 37]. This is contrary to the National Institutes of Health expert consensus report, which states, in addition to radiographic evidence of OA, patients should have moderate to severe persistent pain or

disability or both [52]. These findings are worrisome because patients who undergo TJA at a later stage in their disease have less optimal results [22]. Women reportedly perceive their OA to be less severe [33] and tend to have higher thresholds of disability before considering TJA [39, 66], which may influence their decision to see a surgeon.

We reported physicians included fewer shared decision-making elements when the standardized patient was a woman compared to a man, thereby providing the woman with less medical information and less encouragement to participate in the decision to undergo TKA [7]. Physicians were less likely to discuss the clinical issues of the decision (eg, how long the hospital stay would be) with the female patient compared with the male patient and seldom discussed her role in the decision, assessed her understanding of the decision, or assessed her treatment preferences. This may result in women being less satisfied and less likely to cooperate with the physician [28].

Women and men differ in other ways known to influence treatment choices. Compared with men, women prefer a more active role in clinical decision-making [47] and a collaborative style of communication [21] with their physicians. Women want their physicians to be good listeners [42] to discuss and clarify their medical problems but not necessarily to resolve them [21]. Men, on the other hand, present their medical problems and expect their physicians to resolve them. More women than men reported physicians talking down to them and telling them their problems were "in their heads" [41] and having a lower level of trust in physicians [42]. Together, these findings suggest many factors may result in women being less likely than men to accept physicians' treatment recommendations.

Step 6. Patient Reports Symptoms and Orthopaedic Surgeon Recognizes and Assesses Them

The next step in the process is to be seen by an orthopaedic surgeon. After waiting on average 7 months for a consultation [53] that is likely to last less than 20 minutes [7, 58], the patient presents symptoms of chronic knee or hip pain and the orthopaedic surgeon determines the patient's surgical candidacy. Among those considered medically appropriate for surgery, women were less likely than men to report having discussed TJA with an orthopaedic surgeon [34].

Once a patient is referred to a specialist, Steps 3 through 5 of this process repeat with the new physician [20]. So do many of the explanations. Individuals urged by friends and family members to get a referral for an expert opinion were more likely to have done so [31]. Again, men are more likely to get this advice [31]. Like primary care physicians, orthopaedic surgeons may not recognize the severity of a female patient's symptoms and may interpret women's narrative presentation style as expressing reluctance to undergo TJA. Since patients' expectations are an important predictor of functional outcome [50] and patient satisfaction after TJA [9], an orthopaedic surgeon sensing any reservation from a female patient is not likely to consider her a good surgical candidate [37]. Women may indeed be more reluctant to consider TJA, as women were more likely than men to have heard negative accounts of TJA from friends or family [66]. Clinic-based interventions that provide full and accurate information about TJA and improve the patient-orthopaedic surgeon interaction may empower the female patient in the decision-making process and help surgeons to recognize the seriousness of women's symptoms.

Step 7. Orthopaedic Surgeon Recommends TJA

Unconscious or overt gender bias may also inappropriately influence orthopaedic surgeons' clinical decision-making. Our two standardized patients also visited blinded orthopaedic surgeons during actual clinical practice. The odds of an orthopaedic surgeon recommending TKA to a male patient was 22 times that for a female patient (odds ratio, 22.1; 95% confidence interval, 6.4–76.0) [6]. Orthopaedic surgeons may also hold the inappropriate preconception that women do not receive the same benefit from TJA as men; this may be because women typically receive TJA at a relatively greater degree of disability than men [36, 45, 54] and those with more advanced OA have worse surgical outcomes [22]. Although this is only one study, it does suggest at least a portion of the gender disparity in rates of use of TJA may be explained by gender bias.

Although there is some indirect evidence that women may have worse outcomes after TJA due to systematic differences in factors such as timing of surgery, use of low-volume hospitals or surgeons, and patients' self-efficacy or expectations of surgery [29], the best evidence would suggest, assuming similar preoperative disease severity, women and men derive similar benefits from TJA [9, 10, 45, 49, 54, 56] and experience fewer complications [35, 49, 60, 63]. Perhaps this knowledge has not effectively been disseminated. Orthopaedic surgeons may be differentially recommending surgery to patients based on their perceptions of who deserves TJA [39]. Research is needed to examine the impact of encouraging physicians to challenge personal biases that might affect clinical decisions and providing them with the capacity to overcome their biases [19].

Step 8. Patient Accepts Orthopaedic Surgeon's Recommendation for TJA

In the final step, the patient either proceeds with surgery or rejects the orthopaedic surgeon's recommendation. Willingness is the strongest predictor of having TJA [30]. In a Canadian population-based cohort, 9% of men and 13% of women were "definitely willing" to consider TJA [33]. Despite the relatively equal willingness to have surgery [33], the most important predictor of definite willingness was having previously discussed TJA with a physician [34]; women were less likely to have done so [33]. Individuals encouraged by family or friends to discuss TJA with their physician were more likely to have done so; women were less likely to get such advice [31]. Therefore, despite what they say, women may differ from men in their perceived OA severity and in their beliefs about the indications for and risks and benefits of TJA that make them less willing to undergo surgery.

Qualitative research shows women perceive the risks of TJA to be higher than men. Women had less confidence that the surgical procedure would be successful, were more concerned about surgical complications, and were more averse to taking surgical risk [42, 66]. This translated into how long men, compared to women, were willing to forgo surgery. Men were prepared to have surgery when their OA interfered with vigorous recreational activities, whereas women preferred to wait until their OA was interfering with their activities of daily living [42, 66]. Waiting until activities of daily living are affected before considering TJA is prudent, especially given that women hear more negative accounts of TJA than men [66]. Women and men also differ in their concerns regarding TJA that may influence their willingness to consider this procedure. Women, compared with men, are also more concerned about surgery interfering with their caregiving roles, being a burden on others, the length of time required for recuperation, and supportive care for them during the recovery period [14, 16, 42]. Particularly older women will put aside their own health needs to take care of disabled spouses or grandchildren or defer having surgery because they live alone [25]. In summary, patient preferences play an important role in the differential utilization of TJA between genders.

Discussion

Numerous studies indicate substantial and sustained improvement in patients' quality of life [32] with low complication and revision rates [18] after TJA. While there is low utilization of TJA among medically appropriate and willing candidates in both genders, there is an even lower utilization among women [33, 40]. The multistep framework we propose breaks down the patient and physician decision-making process of referral and recommendation for TJA and allows for identification of possible etiologies of gender disparity.

Our literature review used to develop this framework has some limitations. First, we used only one search engine and there was no attempt to combine the results in a meta-analysis, contact study authors, or assess the methodologic quality of studies cited. However, our review qualifies as a scoping review. Second, we only included published studies and acknowledge a search of the gray literature would have reduced the possibility of a publication bias. Third, a bulk of the literature in this area comes from outside the United States, from countries with socialized medicine, where lengthy waits for surgery exist. There is good evidence of gender disparity in TJA utilization in both Canada and the United Kingdom. A gender disparity in the rates of use of TJA may not exist in the United States; while there are some data to suggest it does [26, 36, 45, 54], a similar population-based study has not yet been performed in the United States. Finally, we limited our framework to patients who recognize their OA as treatable and seek care. Many individuals with disabling hip or knee OA do not view their OA as a disease [16, 31, 37] and therefore never reach Step 1.

Where are we now? It is clear female gender is a barrier to surgery. Inequities identified in Steps 3 through 8 play an important role in explaining gender disparity in TJA utilization. Barriers unique to women exist in their interaction with their primary care physician in the process of referral to orthopaedic surgery and with their orthopaedic surgeon in the process of recommendation for TJA.

Our review identifies important gaps in knowledge and a focus for future research. We need more research on the effect of patient gender on the patient-physician interaction during the clinical encounter. Do patients voice their specific concerns and information needs and how do physicians interpret them? Qualitative studies of recorded routine office visits should be used to investigate the content of patient-physician conversations and the process of relationship building and how this influences physicians' treatment recommendations. So far, there has been one study of this nature in the context of TJA looking at racial disparity [46]. Using standardized patients would allow us to examine the effect of patient gender when the chief complaint, presenting symptoms, and other medically relevant factors are the same [6].

We did not identify any studies evaluating an intervention to reduce the gender disparity in TJA utilization. A previous systematic review found few studies evaluating interventions to improve healthcare quality or reduce healthcare disparities in any disadvantaged populations

with OA and none of these targeted physicians [8]. Particularly important in achieving gender equity in TJA utilization are interventions that address the issues of misperceptions about the risks of, indications for, and expected outcomes of TJA among patients, primary care physicians, and the general public; physicians not recognizing the seriousness of women's symptoms; gender bias influencing clinical decision-making; and women's concerns and information needs about having TJA.

Where do we need to go? Closing the gender gap in TJA utilization is likely to require a multiple-intervention approach. There are a number of interventions worthy of future evaluation. We recommend focusing on developing and evaluating interventions that not only improve the quality of the patient-physician interaction but also reduce gender disparity in rates of use of TJA. Thus, the evaluation of the intervention must include comparing the difference in effect between women and men [8].

How do we get there? Primary care physicians are inconsistent about the level of pain and disability that warrants TJA [17]. Primary care physicians also tend to overestimate the risks and underestimate the benefits of TJA [17], waiting until the disease is far progressed and thus capacity to benefit from TJA is less [22]. These findings are not surprising, as many primary care physicians lack sufficient musculoskeletal training [27] and no treatment guidelines currently exist, beyond expert consensus reports, regarding which patients should be considered for TJA [52]. We still do not know how best to evaluate pain, functional disability, or capacity to benefit, nor have cut points on valid and reliable scales been determined above or below which TJA should be recommended. Tools to assist physicians and their patients in decision-making about TJA are needed. Mass media campaigns [12, 69] may help the general public, healthcare providers, and patients to simultaneously learn about the indications for and expected outcomes of TJA and the potential benefits of treatment earlier in the course of decline due to OA [22].

Orthopaedic surgeons may require interventions that help them to recognize the severity of a female patient's symptoms. For example, patient preference reports (a decision support tool for knee OA) clearly specifying the severity of a patient's clinical condition and summarizing a patient's individual concerns [64] may result in physicians recognizing the seriousness of women's symptoms, paying attention to the task cues rather than the social cues or presentation style. In addition, cultural competency training [2] and shared decision-making skills [11] programs as a core component of medical education emphasize a patient-centered approach that may help to remedy gender disparity [3]. Patient-centered care promotes that each person should be viewed as a "unique human being" [13] and equalizes the power imbalance between physicians and patients [15]. Other educational interventions include skills programs that increase physicians' acceptance and awareness of the unconscious biases that may be affecting their clinical decision-making [19, 51].

Another important factor is that we may not be addressing patients' concerns and information needs about having TJA. Good-quality patient decision aids with evidence-based information about the risks and benefits of TJA help patients to make informed decisions about TJA [64]. Current patient decision aids could be used to improve the patient-orthopaedic surgeon interaction and empower the female patient in the decision-making process. When patients arrive at their surgical consultation prepared and informed, the surgeon can focus on issues of concern to the individual patient, leading to a more efficient clinical encounter and care that is patient-centered. Research is also needed to determine whether current patient decision aids should be tailored to women.

In summary, by separating the decision-making process into eight discrete steps, it becomes clear that barriers unique to women exist at the level of the patient-physician interaction. It is time to evaluate whether interventions that improve the quality of the patient-physician interaction are effective in reducing the gender disparity in rates of use of TJA.

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Appendix 1. MEDLINE Search Strategy

The search terms for MEDLINE are listed below, along with the number of hits obtained from searching Ovid MEDLINE from 1948 to January Week 2 2011.

1. ((total joint or total hip or total knee or joint or hip or knee) adj 2 (surgery or arthroplasty or replacement)).mp. (34,639)
2. exp osteoarthritis/ (33,506)
3. (osteoarthritis or osteoarthros#s or degenerative joint disease).tw. (27,310)
4. arthritis.mp. (136,372)
5. or/2–4 (166,351)
6. (gender-based or gender-related or gender differences or gender factors).mp. (15,222)
7. exp sex factors/ (178,095)
8. ((sex or gender) adj2 (analysis or specific or difference$ or distribution$ or factor$ or inequit$ or disparit$ or inequalit$)).mp. (247,393)
9. or/6–8 (248,198)
10. 9 and 5 (3391)
11. limit 10 to humans (3285)

12. 11 and 1 (288)
13. decision making.mp. or exp Decision Making/ (129,994)
14. 13 and 1 (225)
15. 14 or 12 (504)

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